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The road to deforestation: An assessment of forest loss and its causes in Basho Valley, Northern Pakistan

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Abstract

Deforestation in the Himalayas is generally seen as caused primarily by population growth. Based on interviews and the analysis of satellite images, we critically examine this view using Basho Valley in the Western Himalayas of Pakistan as a case study. Our findings indicate that the forest of Basho has been reduced by at least 50% after the valley was opened up through the construction of a link road in 1968. Large-scale legal and illegal commercial harvesting was carried out after the construction of the road. While legal commercial harvesting was stopped in 1987, illegal harvesting has since continued with the involvement of the Forest Department. The findings of this study do not support theories in which deforestation is attributed to rapid population growth. Instead, mismanagement and illegal commercial harvesting endorsed by the Forest Department have been the main causes of deforestation in Basho Valley.

Keywords: Deforestation; Forest management; Himalayas; Pakistan

1. Introduction

Forest cover in Pakistan is only 5% of the total land area (Government of Pakistan (GoP), 1991) and is said to be rapidly deteriorating, especially in the mountainous regions (The World Conservation Union (IUCN), 2002). The conventional view on deforestation in Pakistan is that rural people overexploit the forests for local consumptive use (Sheikh and Aleem, 1975; Schweinfurth, 1983; Government of Pakistan (GoP), 1991; Food and Agriculture Organisation (FAO), 1998). This view implies the projection of a simplified relationship between deforestation and population growth in the Hindukush Himalaya region (Eckholm, 1975, 1976; Sterling, 1976; Lall and Moddie, 1981; Myers, 1986), which assumes that rapid population growth is the main factor that has led to loss of forest cover. This 'Theory of Himalayan Environmental Degradation' (THED) became the dominant narrative of the Hindukush Himalaya region during the 1970s and 1980s. THED attributes deforestation in the Hindukush Himalaya region to increased human and livestock populations in the mountains. This, it is argued, leads to increased floods and erosion particularly during the rainy season, disturbance of the hydrological cycle, devastating floods on the plains, and reduced life of water reservoirs because of increased sedimentation. THED has later been criticised based on empirical evidence arguing that the alleged relationship between deforestation and population growth is based on inadequate and questionable data (Thomson and Warburton, 1985; Blaikie and Brookfield, 1987; Ives, 1987, 1989, 2004; Hamilton, 1987; Ives and Messerli, 1989; Hofer, 1993; Blaikie and Muldavin, 2004).

International research on environmental change in the Hindukush Himalaya region continues to reject THED. However, THED continues to influence national environmental policies in the region (Blaikie and Muldavin, 2004). Generalisations and mis-perceptions are still presented especially by the media. Ives (2004) has provided an

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account of current mis-representations and generalisations projected in Hindukush Himalaya regions. He notes that 'generalisations only serve to deflect attention from the extent of poverty, mistreatment of poor minority people, and the cruel and self-destructive violent conflicts that are engulfing large parts of the region' (Ives, 2004, p. 228). Likewise, generalisations have played an important role in the politics of the Hindukush Himalaya region (Blaikie and Muldavin, 2004; Ives, 2004). For example, in India, environmental degradation has been used as an excuse for control over natural resources by the central government in the name of scientific management. While in China, THED has been used for political control over minorities.

This study contributes to the current discussion on Himalayan forest cover change and investigates its causes using Basho Valley (Fig. 1) in Baltistan region in the Northern Areas[1] of Pakistan as a case study. Most of the fieldwork was carried out during 2001–2003 and focused on the effects of local use, commercial harvesting and state management on the forest cover. Earlier studies from Basho Valley have suggested that there is extensive deforestation in the area (Velle, 1998; Gudbrandsson, 2002) and that the government has been involved in both legal and illegal commercial harvesting of timber (Steinsholt et al., 1998; Nyborg, 2002). These findings raise the following questions that are specifically investigated in this study:

- What is the extent of deforestation in Basho Valley and when did this deforestation occur?
- What are the causes of this deforestation?

2. Deforestation in the Northern areas

Until the British occupation of India in the nineteenth century, the forests of the Himalayas are considered to have been relatively intact (Khattak, 1976; Chaturvedi, 1992), but thereafter deforestation increased in many parts of the Himalayas (Tucker, 1982; Schickhoff, 1995). After the British occupation of Punjab in 1849, the troubled Sikh rule ended and people started settling down in farming communities in the northwestern hills. As a result, pressure on forests increased for wood, cultivation, grazing and settlements (Khattak, 1976). At the same time, demand increased in the lowlands for timber from the mountainous regions, as a result of integration between the lowlands and the mountains (Schickhoff, 1995). This increased forest exploitation, especially commercial timber harvesting through private contractors, resulted in considerable loss of forest cover (Tucker, 1982). Therefore, degradation of natural forests in parts of the western Himalayas has been a long-term process influenced by changes in the socio-economic environment (Schickhoff, 1995).

However, unlike the other parts of the Himalayas, deforestation in the Northern Areas is a recent phenomenon (Dani, 1989; Kreutzmann, 1991; Knudsen, 1995; Schickhoff, 1997). The population of the mountainous regions in Pakistan has increased very slowly due to traditional birth control measures (Jettmar, 2002), shortage of food (Afridi, 1988), and wars (Afridi, 1988; Schickhoff, 1995). Therefore, the forests of the western Himalayas and the Karakorum situated in the Northern Areas remained intact until the 1960s (Afridi, 1988; Jettmar, 2002; Gohar, 2002). Large-scale deforestation occurred in this area after the introduction of political and administrative reform[2] during the 1970s, when demand for timber increased for construction of government buildings and bridges (Gohar, 2002). Around the same period the construction of the Karakorum Highway opened up previously isolated forested valleys (Knudsen, 1995; Dittrich, 1997), resulting in the initiation of large-scale legal and illegal commercial harvesting of the natural forests (Kreutzmann, 1991; Schickhoff, 1997). In addition, increased deployment of the army along the border with India increased the demand for wood (Rao and Marwat, 2003). The above-mentioned changes in the Northern Areas also impacted on the forest cover in Basho Valley. The following section examines these changes and attempts to establish their causes.

3. Study area

Basho Valley is located in Baltistan region in the Northern Areas of Pakistan (Fig. 1). The valley ascends from the southern side of the Indus River at an altitude of approximately 2150 m above sea level to the Banak La Mountain at 5520 m. Because of the altitude, the area has a marked seasonal climate comparable to that of the temperate zone. The mean maximum temperature during summer is around 30–35 °C, while temperatures may drop to −25 °C in winter.

People in Basho live in seven villages distributed from top to bottom of the valley along the Khar Nullah stream: Sultanabad, Nazimabad, Meito, Guntho, Khar, Bathang and Matillo. The total number of households in Basho Valley was counted to be 286 during the fieldwork and the total population was estimated to be 1950. The population density was calculated to be 22 people per square kilometre in 2003 compared to 166 for Pakistan as a whole in 1998 (Government Statistic Division (GSD), 1999b). Farming and livestock production are the major sources of liveli-

[1]The Northern Areas is the fifth administrative unit of Pakistan consisting of five districts namely Gilgit, Skardu, Diamar, Ghizar and Ghancha.

[2]The NAs consisted of two Political Agencies in 1971, namely Gilgit and Baltistan. In 1972, these agencies were renamed as districts. Gilgit District was divided into two and three districts in 1972 and 1974, respectively. Baltistan District was divided into two districts namely Skardu and Ghanche in 1974. In each district, two to three sub-districts (officially called sub-divisions) were created. This required large amounts of timber for the construction of government buildings in the newly created districts and sub-divisions.

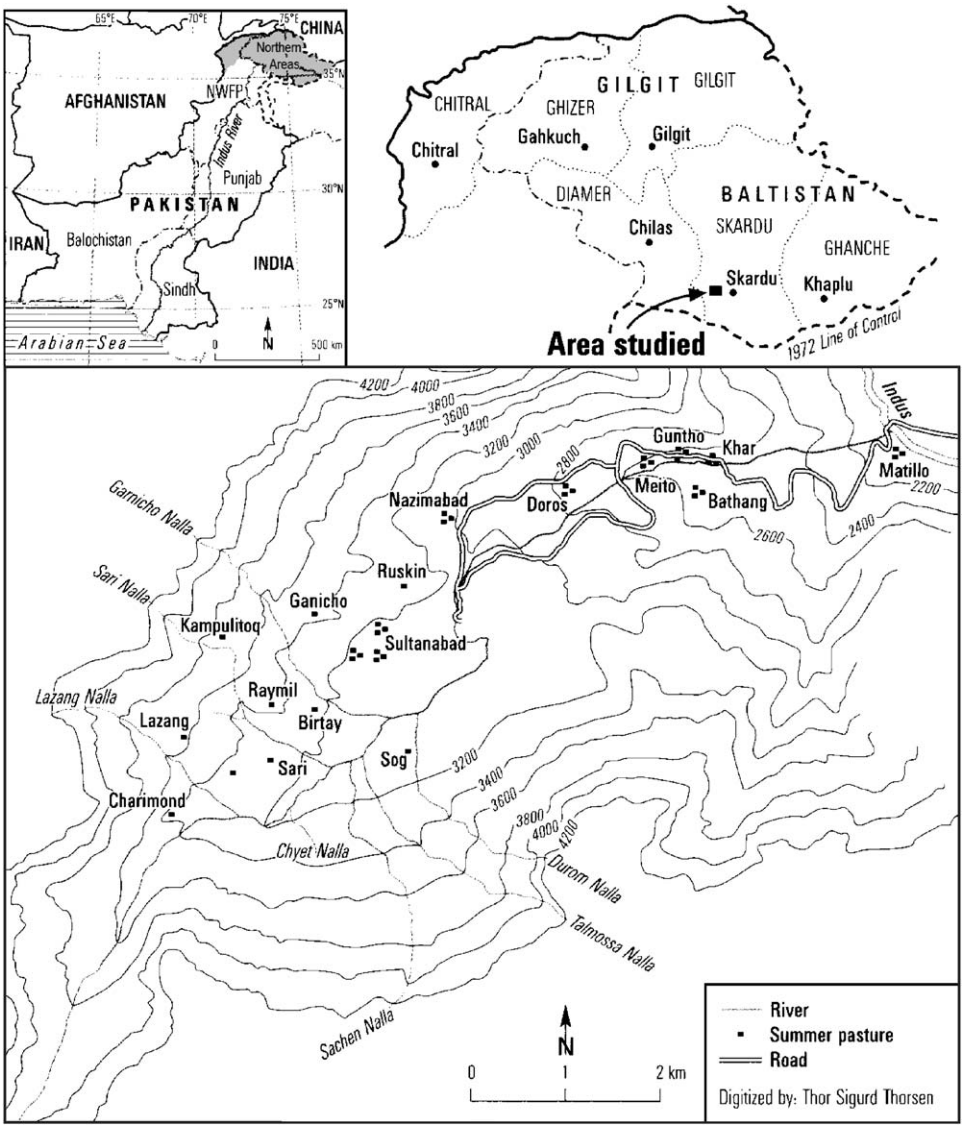

Fig. 1. Map of Basho Valley and its location within Pakistan. Source: Ali and Benjaminsen (2004).

hood. Crop cultivation and plantation of forest trees are based on irrigation carried out by constructing irrigation channels that are fed by glacial snowmelt or springs.

The forests situated in Basho Valley are classified as *protected forest*. This is a legal category, which implies that the government owns the forest, but that all types of use by local communities are allowed unless explicitly restricted by the government (Niazi, 2004). The Basho Valley falls under three vegetation types (Schweinfurth, 1957). The lower northeastern part from the Indus River to about 2500 m elevation is described as sub-tropical semi-desert. The area above the sub-tropical semi-desert is classified as Steppe of Artemisia. The vegetation in the uppermost part of Basho varies greatly from the drier southeastern facing slopes to the moist northwestern slopes. Natural blue pine forest covers the northwestern facing moraine slopes. Grassy slopes and *Juniper macropoda* cover areas where the forest has been cut down.

4. Methodology

The qualitative data for this study were collected by one of the authors during the last 8 years. During this period, the author has formally and informally interacted with the officials of the Government Forest Department, a number of forest contractors and the majority of men and a few women[3] in Basho Valley. Group and individual interviews were conducted during three workshops[4] held in the valley and attended by at least ten male representatives from each village. A list indicating all households and household

[3]Direct access to women informants by the author was difficult due to cultural restrictions.

[4]The workshops were organised by the Aga Khan Rural Support Programme (AKRSP) and the Norwegian University of Life Sciences. The AKRSP is a community-based development organisation that has been working in Northern Areas and Chitral District of the North West Frontier Province in the field of integrated rural development since 1982.

members in the villages was used to interview groups and individuals in each village. Formal group meetings were organised twice in each village. Most of those who were not available during the first round of meetings were interviewed during a second round. In addition, two workshops for men and women were organised to discuss deforestation and future conservation prospects in Basho valley. A total of 30 men and 65 women attended these workshops. During these workshops the men were directly interviewed, while two female colleagues interviewed the women. The qualitative data collected in this process was recorded. The information was further refined through interviewing the following local stakeholders: 16 local elders (14 men and two women), four forest contractors, two local jeep owners who transport wood, members of the Basho Development Organisation (BDO),[5] the opponents[6] of BDO, local conservation volunteers, the owner of the only saw mill in Basho, and 13 Forest Department officials (retired and in service). The local elders were interviewed specifically to understand historical dimensions of forest cover changes. The contractors, Forest Department officials, and the local jeep owners were interviewed to grasp the extent of legal and illegal commercial harvesting. The BDO officials and their opponents were interviewed to understand negotiation processes over access and use of the forest resources. In addition, available records of the Forest Department have been consulted.

However, written records on standing volume, forests and their sizes, history of management and harvesting are not available for the protected forests of the Northern Areas, including Basho (Gohar, 2002). No previous records on standing volume for the protected forests in the Northern Areas are available because forest inventories have not been conducted for these forests except for a part of Basho Valley in 1998 (Velle, 1998). Therefore it was difficult to assess the actual changes in forest cover over time. To overcome this problem, in addition to the oral history by the local elders, two types of Landsat imagery datasets were used to assess change in forest cover during the last decades (Fig. 2). The first type is the Landsat Multispectral Scanner (MSS) image from the 20 July 1976. The second image is a Landsat-7 (ETM+) image from the 16 August 2002. The ETM+ sensor and the MSS have a pixel size of 30 m × 30 m on the ground.

Visual interpretation of digitally enhanced false colour composites was used for the identification of forested areas. Due to the low quality of the MSS data, the comparison was not carried out for the major part of the northwest slope of the valley. To reduce error, estimations have been carried out for areas, which are clearly visible in both the data sets. Forest areas, particularly smaller patches, which were visible in one set of data and not in the other set, have been excluded. Therefore this study mainly estimates forest cover change on the southeast slope of the valley, which is also the main forested area in the Basho Valley.

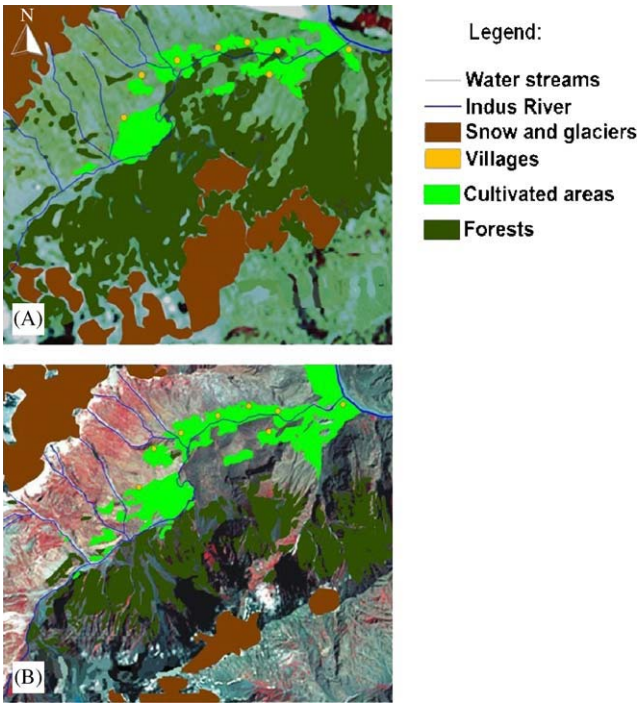

Fig. 2. Interpretation results from the Landsat images. Image A is from 1976 showing a total forest area of 8.70 km^2. Image B is from 2002 showing a total forest area of 4.33 km^2. Scale: Each sub-scene covers an area of 10.2 × 8.5 km.

5. Deforestation in Basho Valley

The forests of Basho Valley are highly vulnerable for two reasons. Firstly, their size is very small. We calculated the total forest area to be 4.33 km^2 in 2002, using the Landsat image. Secondly, the pressure on the forest is high. A local population of about 1950 people depends on the Basho forest for energy needs including heating and cooking (Ali and Benjaminsen, 2004). Wood is needed for heating for at least 7 months per year.

Before the 1960s, access to Basho and other valleys in the Northern Areas was difficult due to their location, hidden high in the Himalayan and Karakorum mountains (Afridi, 1988; Jettmar, 2002). These valleys were opened up through the construction of link roads during late 1960s and early 1970s after the construction of the Karakorum Highway (Kreutzmann, 1991; Dani, 2001). As elsewhere in the Northern Areas, deforestation in Basho started mainly after this development in infrastructure, as reported by the local elders, contractors and Forest Department officials. However, according to the local elders, small amounts of timber from Basho were harvested on a few occasions before 1960 for the construction of a hospital and army

[5]BDO is a local developmental organisation and consists of nominated representatives from all seven villages in Basho valley. The BDO leadership mainly consists of young individuals who support NGO activities initiated for conservation and community development in Basho.

[6]The BDO opponents follow the traditional leadership, which is sceptical of external NGO activities. They see the NGO activities as a threat to religion and local traditions. NGOs working in Basho are the Aga Khan Rural Support Program and the IUCN.

buildings between 1937 and 1960. For example, in 1957 the army harvested around 30 pine trees from Basho. At that time, there was no road to Basho or bridge over the Indus River to cross the valley. The army therefore dragged timber down the valley to reach the Indus. From here, timber was pulled across the Indus using ropes and thereafter transported to Skardu town. Harvesting wood from such an inaccessible area indicates that Basho was the only source near Skardu to obtain quality timber.

5.1. Administrative reforms and deforestation

During the 1960s, the government increased its developmental budget for Baltistan and established new departments, which needed construction of offices and residences for the newly recruited staff (Afridi, 1988). To meet the increased demand for timber for construction, the Forest Department built a bridge over the Indus River and a road into Basho Valley in 1968 to harvest timber. The impact of the construction of the Karakorum Highway and link roads to deeper valleys on 'people and spaces' has been described by Haines (2000): 'The construction of the Karakorum Highway in the 1970s became the ultimate expression of re-routing the nation state of integrating, the now, Northern Areas, into Pakistan' (p. 14). The Karakorum Highway has greatly transformed the economy, society and the resources, particularly the forests, livestock farming and wildlife of the Northern Areas (Schaller, 1980; Allan, 1989; Kreutzmann, 1991; Schickhoff, 1997). However the construction of Karakorum Highway occasionally met with resistance by local people. Therefore, the government had to change the alignment of the road to avoid conflict with local people in some of the areas. For example, the road alignment was changed from Nagar Valley to Hunza Valley by constructing a bridge over the Hunza River. The people of Nagar Valley are considered more conservative in terms of resisting change than the people of Hunza Valley (King, 1993; Shaw, 1996). The people of the present Kohistan district 'were formidable opponents to the construction of the Karakorum Highway because they knew that they would forfeit their autonomy in their 'protected' tribal area' (Allan, 1989, p. 133). According to the village elders interviewed for this study, as elsewhere in the Northern Areas, the majority of the people in Basho were not happy with the construction of the road for many reasons. For example, the bridge and the road construction was a major development in a valley, which had remained relatively isolated for centuries. Therefore, the people were not used to such rapid and major developments. The alignment of the road is such that it passes through the middle of three villages, which was not acceptable to the people of these villages. Women's interaction with outsiders especially with men is socially unacceptable in Basho.[7] The road was therefore considered disruptive to village life, particularly women's mobility. For example, the crop fields are situated on either side of the road and women carry out most of the agricultural activities. The potential visits by outsiders as a result of the construction of the road was seen as restricting women's mobility during the agricultural season. Finally, an important reason for the opposition to the construction of the road was that the road was primarily constructed for harvesting timber. But despite the disagreement by the people of Basho Valley, the government built the road. However, the elders of Basho Valley reportedly predicted that construction of the road would result in harvesting of the forest by outsiders and restrictions on local use.

In Basho Valley, after the completion of the forest road in 1968, the Forest Department started commercial harvesting of the forests (Steinsholt et al., 1998). Meanwhile the government introduced administrative and political reforms in Baltistan in 1974 (Dani, 2001). According to the Forest Department staff these new developments further increased the government's demand for timber from Basho. Commercial harvesting was increased to match the new demands for timber. Initially, timber was harvested by contractors for the construction of administrative buildings, a high school, a rest house and government residential quarters in Skardu town. Later, timber from Basho was harvested for the construction of government buildings and bridges in other parts of the newly created districts and sub-divisions as a result of the political and administrative reforms. Estimates by local elders indicate that the contractors harvested around ten times more than their official quota for the construction of government buildings and bridges. They sold the excess timber in the Skardu market and many built their own houses and shops. Given the inherent scarcity of natural forests in Baltistan, wood, especially timber, is expensive. The local elders remember that contractors from other parts of the Northern Areas were also attracted to the lucrative timber business generated due to initiation of commercial harvesting in Basho. The valley soon became a money-earning place both for the Forest Department staff and the contractors, a characteristic of commercial harvesting reported from other regions of Pakistan (Yusufzai, 1992; Knudsen, 1996; Gohar, 2002). The construction of private houses and shops on a large scale in Skardu town around the same period (Afridi, 1988), when commercial harvesting was carried out in Basho, supports the estimates made by local people. Many of these buildings have been built using blue pine timber, which was only available at that time in Skardu District in the Basho and Ganji Valleys. In 1987, after realising that commercial harvesting of timber in Basho had led to serious deforestation, the government banned all cutting of green wood in the valley. However illegal harvesting still continues although with less intensity. The ban also restricted local use of timber. Evidence from other areas in the Hindukush Himalaya region suggests that the ban on logging remains ineffective and reduces the livelihood

[7] See Nyborg (2002) for a detailed discussion on social restriction on women in Basho.

options of poor and marginalised people (Blaikie and Sadeque, 2000; Gohar, 2002). One reason for the ineffectiveness of regulations has been the ability of the 'forest mafia' to evade bans (Knudsen, 1996) through bribing the local police who provide protection for illegal harvesting operations (Rangan, 1995).

5.2. The State's involvement in deforestation

Contractors, who harvested wood in Basho during 1968–1987, said that obtaining permission from the government to harvest timber was only a formality. It was carried out in good faith as the government wanted fast development of Baltistan, which needed construction of buildings to meet the increasing demands for offices and residences. The then Political Agent of Baltistan, Banat Gul Afridi, who is famous for his contribution to the development of the region, distributed free land in Skardu town for the construction of shops and houses. Afridi visited most of the forested valleys in Baltistan to survey the availability of timber to be harvested commercially (Afridi, 1988). Taking advantage of the flexibility given by the government to speed up the development of the area, the contractors harvested more than what was needed for the construction of government buildings. Therefore, records were not kept for the extra illegal harvesting.

The local elders in describing the extent of forest extraction during the period of commercial harvesting (1968–1987) said '*Loot much ghai thee*' (the forest was looted). They also said that before the commercial extraction the local people had no idea of the economic value of the forest except in terms of small household products. Timber was not sold outside Basho. It was after the initiation of commercial harvesting that people realised the economic importance of the forests. The Forest Department staff posted in other areas of Baltistan also came to Basho to harvest trees to sell or to build their own houses in their respective villages. The contractors transported timber for the Forest Department staff free of charge.

In addition to the green trees, a large amount of dead and fallen wood was also given free of charge without formal permits. For this purpose, the Forest Department officials issued informal hand written permits called *chits*. The word *chit* is derived from the Urdu word *Chitthe* meaning a letter. A *chitthe* is generally written using a full page, while a *chit* could be written on any size or type of paper depending on what is available. The local people have use rights in Basho forests for collection of firewood for local use, therefore they do not need *chits* or formal permits to harvest firewood. The Forest Department officials issue formal permits to outsiders charging a nominal tax for collection of limited quantities of firewood for domestic use. By mis-using legal powers, the Forest Department officials allocated a considerable amount of wood through *chits* to influential people (both locals and outsiders), officials and wood traders who could either offer direct payments or share the income from the wood sale with the Forest Department officials. *Chits* are used to transport wood through the checkpoints where junior forest officials check vehicles carrying wood. Those who can produce a formal permit or a *chit* can pass through. The formal permits and *chits* indicate the amount of wood allowed for transportation. However our observations from Basho and a few other checkpoints in the Northern Areas indicate that the junior officials at the check points allow more wood than what is permitted by the senior officials. Therefore the *chit* holder could bribe both the senior officials who issue the *chits* and the junior officials at the checkpoints. Hence, the *chit* holders would make a good profit by selling the wood in the market. For example, the firewood harvested using *chits* and formal permits was sold in Skardu for PKR 350 per 100 kg while the government tax to be paid for formal permits is only PKR 7.5 per 100 kg (Ali and Benjaminsen, 2004). *Chits* do not go through the formal legal procedure as required for a formal permit therefore even the nominal government tax is not charged. The Forest Department does not keep records for *chits*, whereas for official permits, the government tax has to be charged and therefore records are generally maintained. Collection of timber using informal permits has also been reported in other studies from Basho (Nyborg, 2002).

Corruption through mis-use of legal powers by officials is widespread in many developing countries (Dauvergne, 1994; Tropical Rainforest Programme (TRP), 2000; Duperouzel, 2003; Fenner et al., 2003; Ferrieux-Patterson, 2003). Robbins (2000) suggested that corruption in natural resource management will be common in situations where officials have monopoly over environmental goods and when relatively few officials have exclusive rights to issue permits. Taking advantage of such opportunities, the officials could issue preferential licences and demand bribes. The Baltistan Forest Department was newly established at the time of commercial harvesting (Afridi, 1988) and was operating with a small number of officials. According to the Forest Department officials interviewed, there were around ten Forest Department officials including two senior officials in Baltistan in 1968 compared to 130 including seven senior officials in 2004. Therefore it is likely that the few Forest Department officials mis-used legal powers during the commercial harvesting. In addition, the Forest Department official also would have taken advantage of the district administration's push for logging to fulfil timber needs for construction in Baltistan. In such instances, one sector may develop at the cost of another sector (Food and Agriculture Organisation (FAO), 2002). For example, construction of bridges and government buildings in Baltistan at the expense of deforestation in Basho. Following Smith et al. (2003), the large-scale illegal harvesting carried out in Basho, particularly using the *chits* could be classified as 'collusive corruption'. In collusive corruption, government officials and contractors collude to appropriate public property. This is done, for example,

through allowing contractors harvest and transport wood without formal permits and payment of government taxes in return of sharing income generated through illegal transactions.

5.3. Local perceptions of deforestation

According to the village elders, dead and fallen wood is no longer easily available in the forest as it was in the past. Therefore, people (mostly young girls responsible for collection of firewood) have to travel longer distances to collect wood. According to the two elderly women interviewed who have been collecting wood in the forest for the last 40 years, before the period of commercial harvesting, dead and fallen wood in nearby forest areas was sufficient to meet local firewood needs. People did not need to cut standing trees for this purpose. At the same time a few standing trees were cut annually for the construction of houses locally. Because there was no tradition of building big houses, timber was needed in limited quantities. The majority of houses built before the 1980s consist of a single room partitioned into a bedroom and a kitchen. Since the 1980s, people's standard of living has improved and some houses have been built with several rooms. A village elder, aged 75, who has been visiting the forest for the last 60 years, remembered well the start of commercial harvesting in the valley. 'The contractors carried out a *qatle aam* (massacre) of the forest and it is incredible to see that some trees are still surviving', he said. He estimated that the forest had been reduced by 60% during the last 60 years and remembered that the forest was well intact until the road was built and contractors started exploiting the forest in 1968. 'The contractors behaved like a cat' he continued. 'The cat will not drink a little if she finds a pot full of milk'. The other 15 elders interviewed estimated a reduction in forest cover of 30–45% during the last 30 years. Those elders who live close to the forest however estimated a 45–60% loss. The estimations made by the local elders closely match the estimation made using the satellite data. The dataset from 20 July 1976 shows that the total forest area at that time was 8.70 km^2. The second set of data from 16 August 2002 indicates a total forest area of 4.33 km^2. The reduction in forest cover between the two dates was calculated to be 50.2%. If it had been possible to quantify the change in smaller patches as well and to assess changes in forest density, this percentage would presumably have been larger.

5.4. Struggle for control: community vs. state

The struggle for control over natural resources in the Hindukush Himalaya region has a long history (Tucker, 1984). Traditionally, the forests were managed by the local resource users. In 1865 the British created the Forest Department to take control of the commercially important forests to ensure a continued supply of timber. The Forest Department thus began a process of taking control of the forests throughout India and Pakistan. However, in remote areas with less commercial forests, the Forest Department was established much later. For example, in the Baltistan region commercially valuable forests are scarce and are situated high up in the inaccessible valleys. The Forest Department in Baltistan was established in 1968 when the central government increased its political and administrative control in the Northern Areas (Afridi, 1988). Soon after its establishment, the Forest Department initiated commercial harvesting in many valleys. Since then, the Forest Department has increased regulations for greater control, while the communities have struggled to regain control of the forests and other natural resources (Wegge, 1988; Knudsen, 1993; Gohar, 2002). For example, in 1985 the people of Basho Valley demonstrated against continued commercial harvesting and met the military authorities (the army ruled the country during that period) in Skardu town. The community activists also contacted NGOs to influence the government. The ban on commercial harvesting in 1987 was the result of these efforts. Commercial exploitation continued illegally, however, although with less intensity. To stop this exploitation, the BDO made a verbal agreement with the Forest Department for the protection of the remaining forest in 1998. The World Conservation Union (IUCN) and the AKRSP supported the agreement. As a result, the BDO appointed seven community guards to detect illegal wood transportation. The Forest Department and the BDO had agreed that wood confiscated would be sold and the guards would be paid from this income. The community guards worked for a year but stopped working due to lack of payments by the Forest Department. Later, both the Forest Department and the community guards have been observed transporting timber to Skardu. Failure of agreements between the Forest Department and communities has also been reported from other valleys in the Northern Areas (Gohar, 2002). In fact, these agreements were made in response to occasional agitation by the community supported by NGOs, rather than a change in policy to involve the communities in forest management. Therefore the agreements were dishonoured by the Forest Department once local pressure ceased or after the transfer or retirement of the Forest Department officials who made the agreements.

In December 2000, the BDO made a second attempt to stop illegal transportation of wood from Basho to Skardu. With the consent of the Forest Department, they established a checkpoint near Basho Bridge (the exit point from Basho). Two Forest Department guards and a community appointed guard were assigned to monitor illegal wood transportation at the checkpoint. But this attempt was also unsuccessful, mainly because of involvement of Forest Department staff and locals in the sale of wood. Some BDO supporters and opponents were found transporting wood to Skardu during the night. These incidences intensified the conflicts between the rival groups, resulting in occasional fights. After a recent scuffle, the police briefly took activists of both parties in custody and later released

them on bail. This could imply that it has now become easier for offenders to transport wood outside Basho. Their opponents would not dare to stop them, because activists of the both parties have been bound by the police not to create problems for each other. Whoever would begin a fight with the offenders in an effort to stop illegal wood transportation would lose the bail money. The BDO activists claim that some police staff get a share both in cash and in kind from the BDO opponents. Therefore the police staff has an incentive to close their eyes to illegal wood transportation from Basho. The BDO opponents, on the other hand, claim that the BDO leaders get a share from the wood sold by BDO supporters.

Currently large-scale illegal harvesting of wood from the Basho forest including using the *chits* has ceased as a result of community agitation and the ban by the government on harvesting. However, it appears that it would be difficult to stop illegal harvesting completely because the government staff (Forest Department and police) and local powerful people have economic interests in the illegal harvesting of the forests. A limited quantity of wood is still transported illegally using *chits*. Also, applying for a *chit* has become a norm that can be illustrated by the following example: In August 2003, the AKRSP organised a workshop for community leaders in Basho. An official of the Forest Department also participated. The objective of the workshop was to create awareness regarding forest conservation. The workshop participants unanimously adopted a resolution asking the Forest Department to stop issuing *chits*. At the end of the workshop, three participants requested the Forest Department official to write a *chit* for them on the spot, but the official denied it. However such events indicate that corruption in resource management has become a norm. Corruption, particularly in forest management, is widespread in developing countries (Yusufzai, 1992; Corbridge and Kumar, 2002; Contreras-Hermosilla, 2002; Rosenbaun, 2002; Smith et al., 2003; Ali and Benjaminsen, 2004). The Pakistan Anticorruption Bureau (PAB) reports that, 'corruption is largely socially accepted as a norm and regarded as inevitable' (Government of Pakistan (GoP), 2002, p. 5). The PAB report shows that during the last 4 years, around 400 people have been convicted for corruption in Pakistan, most of them government officials for mis-using authority. Robbins (2000) suggests that 'corruption is an institution. Corruption transforms equitable rules of resource management into inequitable ones through the establishment and reproduction of persistent institutions along strong networks of cooperation between elites and the officials' (p. 18). Robbins further explains that the traditional view of corruption sees it as arising from the lack of legitimate state power. Therefore officials are appointed to monitor the behaviour of existing officials, which creates an additional layer of corrupt officials. To avoid this, institutional reforms have been suggested giving more powers to the resource users who themselves could increase accountability of both the officials and local resource users (Hobley, 1996; Agrawal and Ribot, 1999; Robbins, 2000; Sarin, 2001; Castren, 2005).

6. Implications of the study

Much of the debate on environmental changes in the Hindukush Himalaya region for the last three decades has been focussed on Nepal and India. The environmental history of India and Pakistan has been relatively similar because of the similar colonial origins of environmental policies in both countries (Champion, 1953). Like India, Pakistan also still manages its forests using the colonial regulations, particularly the Forest Act 1927 (Knudsen, 1995; Gohar, 2002). For forest officials, the 'status' of the Act is 'almost that of a holy text, a bastion, of order, and a reasonable and just regulation in the face of declining environmental management, unwarranted meddling by populist politicians, and uninformed local protest' (Blaikie and Muldavin, 2004, p. 531). THED has also been instrumental in formulating environmental policies in Pakistan. Therefore this study is an effort to contribute to the current discussion concerning environmental change in the Hindukush Himalaya region. It brings empirical evidence on the causes of deforestation in one valley in the Hindukush Himalaya region.

Unlike THED, which attributes deforestation to local use, this study verifies the findings of earlier studies conducted in the Northern Areas (Knudsen, 1995; Schickhoff, 1997; Gohar, 2002; Ali and Benjaminsen, 2004) that attribute environmental changes to increased accessibility due to road construction, corruption and failed government policies. Therefore, this study adds empirically to the research base undermining the dominating policy narrative regarding environmental change in the Hindukush Himalaya region. This study also contributes to the debate on community-based conservation of natural resources, particularly forests. Currently, efforts are underway to involve resource users in community-based conservation in the Hindukush Himalaya regions (D'Silva and Nagnath, 2002; Damodaran and Engel, 2003; Rao and Marwat, 2003). Large areas have been designated as conservation areas for this purpose (Ali, 2002; Ives, 2004). The local communities and the Forest Department are seen as the key actors in community-based conservation. However, similar efforts in the past have not been successful, partially because the government institutions managing the natural resources are corrupt and resist devolution of control over resources (Knudsen, 1996; Blaikie and Muldavin, 2004; Ives, 2004; Castren, 2005). In addition, the Forest Department in Pakistan being a corrupt institution (Knudsen, 1995; Gohar, 2002; Nyborg, 2002; Ali and Benjaminsen, 2004), it adheres to a rigid model of forest management, 'fortress forestry', and continues to work with the protectionist style of management designed centuries ago (Myers and Bass, 1999). Therefore our findings question the implementation of community-based conservation in the Northern Areas without institutional reforms. In many parts of the world,

community-based conservation has failed to achieve its goals and has mainly served the interests of officials and elites (Sarin, 2001; Corbridge and Kumar, 2002; Kumar and Vashisht, 2005). In many of these cases, forest services see community-based conservation as a challenge to their professional skills and income, which they earn through collusion with wood traders (Castren, 2005). To overcome these problems, Agrawal and Ribot (1999) suggest that community-based conservation need to be based on accountability. And accountability, they argue, could be best accomplished if powers to make decisions regarding natural resources management are given to institutions (for example locally elected community representatives) that are downwardly accountable to their constituents instead of officials who are upwardly accountable to senior officials.

For Basho Valley, a plan for community-based conservation of natural resources was developed in 1999 (The World Conservation Union (IUCN), 1999). One objective of the plan was 'to promote forest conservation through management for environmental benefits and to meet genuine needs of the local community'. However, except for a trophy hunt for which the community received their share of trophy income, it has not been possible to implement anything, because of the absence of enabling policies and regulations. Blaikie and Muldavin (2004) argue that the National Conservation Strategies in some of the Hindukush Himalaya countries 'consists of shopping lists of desirable things, which are rhetorically called into existence for public consumptions but rather less for implementation' (p. 527). Although empirical evidence shows mis-management of natural resources by the state, the Forest Department still controls the forests in Pakistan. The management system on the ground has not changed, despite calls in the National Conservation Strategy for devolution of control over resources to 'revitalise community-based management for the sustainable use of common resources and infrastructure' (GoP, 1991, p. 140).

7. Conclusions

Reliable estimates of forest cover change in the Himalayas can best be made using a combination of methods. Unlike in parts of India and Nepal, where forest cover change has a long history, deforestation in Basho Valley is a recent phenomenon. Until the 1960s, the forest in Basho Valley remained relatively intact, but in 1968 commercial harvesting was initiated following the construction of a jeep road up the valley that linked it with the Karakorum Highway. As a result of this increased access to a valuable forest and the corrupt behaviour of government staff, the forest has been reduced considerably during the last 30 years. Deforestation due to construction of roads and commercial harvesting has also been reported by Schickhoff (1998) from other valleys in the Northern Areas. He found that thick forest stands are situated in valleys with no roads, while degraded forest patches are found where valleys have been linked with roads to the Karakorum Highway.

People have inhabited Basho Valley for centuries and grazing, collection of wood for local use and conversion of forests for cultivation may have influenced forest cover. However, the population of Baltistan (including Basho) has increased very slowly during the last 50 years. For example, for the period 1951–1961 the average population growth for Basho was recorded as almost zero (Afridi, 1988). According to the local elders this was because of high mortality rates due to epidemic diseases. The annual average population growth rate of Baltistan between 1951 and 1981 was also very low, reported as 1.7% (Government Statistic Division (GSD), 1982). Even for the longer period of 1951–1998, the population growth of Baltistan was relatively low, at 2.5% per year (Government Statistic Division (GSD), 1999a) compared to the national population growth rate of 3.5% for the same period (Government of Pakistan (GoP), 2003). Therefore, the influence of local use on forest cover seems minimal compared to the enormous commercial harvesting carried out during the last decades.

We found that improved accessibility combined with mis-management of the forest by the Forest Department during the period of commercial harvesting have been key factors in deforestation in Basho Valley. The Forest Department supported large-scale illegal commercial harvesting by the contractors who harvested the forest at will. The contribution of contractors in deforestation endorsed by the Forest Department has also been documented from other parts of Pakistan. For example, a serious decrease in forest cover has been attributed to over-cutting by contractors with the cooperation of the Forest Department staff in Nagar and Chilas Valleys in the Northern Areas (Gohar, 2002).

Considerable damage to the forest in Basho Valley has occurred due to the legal powers of the Forest Department officials. Most of the dead, fallen and green wood from Basho forest was taken out by contractors and other outsiders using informal permits called *chits*. Issuing *chits* has become an established practice. The Forest Department officials benefit from this system through receiving payments.

Using oral sources as well as satellite imagery this study estimates at least a 50% loss of forest cover over the last 30 years. The theory of massive deforestation due to rapid population growth is not supported by the data collected for this study. Mis-management and illegal harvesting endorsed by the Forest Department have been the main causes of deforestation. Local communities and NGOs have argued for devolution of control over resources in order to involve local resource users for sustainable management of the remaining forest. However the Forest Department has increased its control over forested areas and has imposed a ban on all kinds of harvesting including for local use. Deforestation blamed on local communities has served as a justification for the ban. 'If deforestation

and accelerated erosion are regularly being reported, there are continuing grounds for attempting to maintain or increase regulations and to exclude local control and management' (Blaikie and Muldavin, 2004, p. 532). There are many other examples in northern Pakistan where the government has mis-managed the forest and has blamed the local users for deforestation (Knudsen, 1993; Gohar, 2002). Basho is therefore not the only case where deforestation is the result of mis-management by the government and not of population growth and local use.

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